mine their performances, it seems possible now to resolve some of the complex processes and lesions embraced in the general notion of corneal inflammations into more simple factors and to arrive, if not at an exact understanding, at least at a reasonable conception of the relationship of their phenomena to each other and to those of normal physiology.

In a summary of the seven cases of blood-staining of the cornea which I have studied, the following questions arise. What are these refractile bodies? How do they gain access to the corneal stroma? Why are they present in one severe eye injury and absent in another? Why are they never found near the periphery of the cornea? Why do we get a complete disappearance of the refractile bodies and of discoloration in some cases?

The answer to these questions indicate much diversity of opinion among pathologists. Treacher Collins considers the discoloration due to fluid passing through Decemet's membrane by a process of diffusion and depositing hematoidin crystals in the corneal stroma, associated in some cases with hemosiderin. Weeks is of the opinion that the pigment enters the cornea through the spaces of Fontana in the soluble form of hemoglobin and is there transformed into a salt, insoluble in the fluids of the cornea. Vossius thought there was a direct hemorrhage into the substance of the cornea, the blood coming from the vessels at the limbus.

Baumgarten regarded the refractile bodies causing the discoloration as micro-organisms. Von Hippel and Leber, as fibrin coagula. Romer, as globulin masses.

I am of the opinion that the refractile bodies are pigment granules transformed from hemoglobin, and that they reach the cornea both by diffusion through Decemet's membrane and through the spaces of Fontana, although in a previous article I stated a contrary opinion.

The reason we find no refractile bodies or discoloration at the periphery of the cornea I ascribe to the following circulatory changes, due to the presence of a foreign body within the corneal stroma. It is a well-established fact that in injuries to a non-vascular tissue like the cornea, for example, the primary reaction to the damage, manifested by the fixed connective tissue cells, is often complicated by the wandering in of leucocytes from the conjunctival blood-vessels. This participation of distant blood-vessels and leucocytes is, no doubt, incited by a reflex stimulation of the nerves of the blood-vessels, and may be encouraged under certain conditions by the absorption of certain injurious substances which are carried to the nearest blood-vessels by the lymphatics. Thus it is, that in a condition of blood-staining of the cornea, just as in an injury to the cornea, the lesion becomes complicated by a secondary participation of adjacent blood-vessels and, depending upon the degree of this secondary participation of the adjacent blood-vessels, the circulation at the limbus may carry the degenerated blood-cells and refractive bodies in part, or entirely, into the circulation, leaving the cornea clear at the periphery or restoring it almost to its normal state.

THYROIDITIS

By H. H. SEARLS AND E. I. BARTLETT *

(From the Department of Surgery of the University of California Medical School)

Acute thyroiditis is quite rare in this country, and is most commonly found as a sequel to tonsillitis, otitis media, scarlet fever, pneumonia, and typhoid.

Exophthalmic goiter may follow an acute thyroiditis, or, with extensive destruction of the gland, evidence of insufficiency may develop.

Under the heading of chronic thyroiditis, tuberculosis and lues must be given brief mention. Tuberculous thyroiditis is a common incident of miliary tuberculosis.

Syphilitic thyroiditis, always a rare disease, has under the rationale of modern anti-luetic treatment become an even less frequent finding.

A true chronic diffuse thyroiditis is very difficult of diagnosis. Thus, of seventeen such cases selected for their typical pathological picture from the files of the University of California Hospital, only three were correctly diagnosed pre-operatively, the condition in eight being called toxic adenomata, and in the remaining six, hyperplasia.

Because of this high percentage of error in diagnosis, a careful study of the case records of these patients has been made in an effort to determine any clinical points of differentiation which might aid in establishing, preoperatively, the true nature of the pathological condition.

DISCUSSION *by John Hunt Shephard, San Jose; Wallace I. Terry, San Francisco; C. L. Hoag, San Francisco; H. Lisser, San Francisco.*

INFLAMMATIONS of the thyroid gland may be grouped into the acute, sub-acute, and chronic types. It is planned here, after a brief discussion of the other forms, to dilate at length on the chronic diffuse type.

Acute thyroiditis is quite rare in this country, and is most commonly found as a sequel to tonsillitis, otitis media, scarlet fever, pneumonia, and typhoid. The general picture is one of severe systemic reaction developing suddenly with chills, high fever, and prostration. Locally, the gland is enlarged, very firm, fixed, and quite tender. The reaction may remain localized in one lobe, or less commonly, involve the entire structure. The patient complains of severe pain, together with marked pressure on the trachea and esophagus. The process may go on to suppuration, requiring drainage, but more commonly subsides rather quickly under treatment. Exophthalmic goiter may follow an acute thyroditis, or, with extensive destruction of the gland, evidence of insufficiency may develop. There is desquamation of the epithelium lining the acini, disappearance of colloid, and tremendous invasion of the in-

* **Henry Hunt Searls** (Department of Surgery of the University of California Medical School). M. D. University of California. Practice limited to Surgery. Hospital connections: University of California Hospital. Appointments: Instructor in Surgery, University of California Medical School.

Edwin I. Bartlett (Medico-Dental Building, 490 Post Street, San Francisco). M. D. Johns Hopkins. Practice limited to Surgery and Surgical Diagnosis. Hospital connections: University of California Hospital, South San Francisco Hospital. Appointments: Assistant Clinical Professor of Surgery, University of California, and Surgical Pathologist University of California Hospital. Publications: "Chronic Lesions of the Lower Lip" (California State Journal of Medicine, October, 1921), "Clinically Doubtful Breast Tumors—Their Diagnosis and Treatment," Annals of Surgery (June, 1921), "A Tumor of the Scapula," "A Bone Cyst of the Humerus," "A Case of Clinically Doubtful Breast Tumor," "The Surgical Clinics of North America" (Vol. 2, No. 2), "Mesenteric Cysts," "Mikulicz's Disease," "The Surgical Clinics of North America" (Vol. 3, No. 3), "The Treatment of Blue Dome Cyst" (Journal A. M. A., August 2, 1924, Vol. 83, pp. 343-347), "Breast Hypertrophy—Non-surgical Breast Conditions (Surgery, Gynecology and Obstetrics, June, 1924, pp. 798-805).

teracinar spaces by lymphocytes and polymorphonuclear leucocytes. There may be small hemorrhages. Thrombosed vessels are noted. The gland is congested and edematous.

Riedel, in 1896, first described a sub-acute inflammation of the thyroid coming on fairly rapidly, causing some pain and marked pressure, and chiefly characterized by an extreme degree of induration. Emphasizing this latter finding, Riedel named it "iron-hard strumitis." The French later applied to it the more commonly accepted term "ligenous thyroiditis." Because of its consistency and fixity to surrounding tissues, it is often pre-operatively diagnosed malignancy. The condition is characterized by a tremendous fibrosis, with absence of colloid and obliteration of the epithelial cells and acini of the gland. This rapidly forming fibrous tissue gives the extremely hard consistency to the tumor. As the new scar tissue develops in the isthmus of the thyroid, it contracts, pulling the two lateral lobes tightly against the trachea, resulting in an alarming sensation of choking. Section of the isthmus relieves this symptom, the elastic tracheal rings causing the two lobes to spring apart. No further surgery is indicated, the patient making a good recovery without excision of thyroid tissue. The records of two such cases are on file at the University of California Hospital. In both instances the possibility of malignancy was seriously considered. In one of these streptococcus viridens was cultivated from a small section removed from the isthmus. An identical organism was obtained from the patient's throat.

Under the heading of chronic thyroiditis, tuberculosis and lues must be given brief mention. Tuberculous thyroiditis is a common incident of miliary tuberculosis. However, as a primary condition it is extremely rare and is very difficult of diagnosis. Mosiman, in 1917, gave an excellent report of nine cases. None of these had been correctly diagnosed before operation. Their true nature was found only after careful pathological study. Seven had been clinically diagnosed exophthalmic goiter. Two had exophthalmos. These nine cases represented less than 1 per cent of available material.

Syphilitic thyroiditis, always a rare disease, has, under the rationale of modern anti-luetic treatment, become an even less frequent finding. Here, again, malignancy has been usually considered and diagnosis only obtained by histologic study or by response to treatment for concomitant lues.

A third type of chronic inflammation—a diffuse thyroiditis of non-specific etiology—has been made the main basis for our investigation. In exophthalmic or hyperplastic goiter, cells of the lymphocytic series are an acknowledged part of the pathologic picture. Such "round cells" may be grouped in follicles or scattered between the acini. When the infiltration is more advanced and is associated with desquamation and fibrosis, the picture becomes, in part at least, that of a chronic thyroiditis. At times the chronic inflammatory reaction is so advanced as to dominate the picture, and we find no evidence of accompanying hyperplasia. This condition, a true chronic diffuse thyroiditis, is very difficult of diagnosis. Thus, of seventeen such cases selected for their typical pathological picture from the files of the University of California Hospital, only three were correctly diagnosed pre-operatively, the condition in eight being called toxic adenomata, and in the remaining six, hyperplasia.

Because of this high percentage of error in diagnosis, a careful study of the case records of these patients has been made in an effort to determine any clinical points of differentiation which might aid in establishing pre-operatively the true nature of the pathological condition.

A second series (20 cases) in which the pathological picture was that of hyperplasia, with an associated chronic thyroiditis, was also analyzed from the standpoint of the clinical picture in an endeavor to establish grounds for a secondary diagnosis of inflammation. Many authorities feel that such an inflammatory reaction always is to be found in hyperplasia of the thyroid, and that it plays a part in the etiology of exophthalmic goiter. Against this view, definite evidence of associated thyroiditis has only been found in about 50 per cent of cases in our pathological examination of hyperplastic thyroid material.

From the analysis of these two groups of cases it is believed that the following points may suggest chronic inflammation of the thyroid, either as a clinical entity or as a secondary condition in a frank hyperplasia:

(1) A history of recent severe infection in the mouth (particularly tonsillitis). (2) Symptoms and signs of decreased function, such as falling hair, thinned eyebrows, dry skin, together with hyperthyroidism—a mixed picture often seen—suggests thyroiditis, with or without hyperplasia. (3) A slight swing in the temperature curve is suggestive. (4) On palpation, indurated areas may give a nodular impression, strongly suggesting adenomata. Even at operation, the surgeon may mistake this variation in consistency in different parts of the gland for encapsulated tumors. (5) Practically always, adhesions of the surrounding muscles to the capsule of the thyroid are noted. Chronic inflammation is, perhaps, more logically a cause of such adhesions than Roentgen therapy. (6) A tender lymph node over the isthmus, in one case of frank hyperplasia, led to an additional diagnosis of thyroiditis.

In differentiating between chronic thyroiditis alone, and hyperplasia with inflammation, the following points may be of value: (1) Exophthalmos, bruit, and thrill are pathognomonic of hyperplastic goiter. (2) Tenderness over the gland is common in thyroiditis. (3) The basal metabolic rate is rarely elevated in chronic thyroiditis without associated hyperplasia, and may be even below normal. (4) The gross picture at operation of a vascular friable adherent gland, which on section shows a mottled surface and increased fibrosis, will suggest thyroiditis.

Most of these points are only suggestive leads which may, when a number of them are noted, be of sufficient weight to warrant a diagnosis of chronic inflammation with or without hyperplasia.

Absorption of products of inflammation, rather

than a true thyrotoxicosis, may account for the toxic picture seen in some of these cases. For instance, a hemoglobin of 30 per cent in one case of diffuse thyroiditis may have in part resulted from the chronic infection.

Pathologically, the gross picture of chronic thyroiditis, as in hyperplasia, presents in varying degrees a meatiness of the gland, due to absence or marked diminution of the colloid content. The cut surface in thyroiditis, however, shows a faintly yellowish tint with a mottled appearance, due to grayish spots scattered over the surface, while in hyperplasia the uniform resemblance to fresh veal, grayish pink in color, is diagnostic.

Microscopically, thyroiditis is shown to be a replacement of thyroid epithelium by scar tissue or other inflammatory elements. The appearance of lymph follicles has no significance. There is destruction of thyroid epithelium and a so-called "round-celled" reaction under the capsule, along the blood-vessels, and between the acini. This infiltration may become so advanced as to practically destroy the glandular elements over large areas. The picture may show this progressive destruction, with replacement of epithelium by scar tissue, or there may frequently be found areas of regeneration. This regeneration resembles hyperplasia of the type in which new alveoli are being formed. Sometimes, with subsidence of inflammation, the picture may be confused at first glance with hyperplasia, and it is only by finding the irregular spotty changes in the gland that the true inflammatory nature of the pathology is recognized.

The treatment of chronic thyroiditis, when one considers the pathology, seems rationally to consist in the removal of the diseased tissue. Eradication of foci of infection within the mouth would also appear to be logical. A bilateral subtotal lobectomy has been performed on all the patients in this series. The convalescence has been quite similar in most instances to that of the ordinary exophthalmic goiter.

In closing, a partial follow-up report of the cases under analysis may be of interest. Of the seventeen cases of chronic thyroiditis from four years to six months, post-operative, nine have answered follow-up letters recently. One received no benefit from her surgical treatment, became progressively weaker, developed a psychosis and died. Another died a few months after operation of an apparently independent condition. Of the remaining seven, two report that they were moderately improved, two that they were very markedly improved, and three that they were completely cured by their surgical treatment. Concerning the effect of treatment on signs and symptoms of insufficiency, four noted marked improvement and three observed no change.

From the follow-up study of the cases showing hyperplasia with thyroiditis, prognosis was far better than in the pure thyroiditis cases. Nine out of the twenty cases answered follow-up letters. All of these felt that operation had cured them. Signs of hypothyroidism, described above as an important part of the clinical picture where hyperplasia is accompanied by thyroiditis, were more persistent. Only three noted return to normal, in amount and texture of their hair and a cleaning up of their skin. Four considered that there was some improvement, while in the remaining two these conditions have become worse. The two cases of "iron-hard" thyroiditis are being closely followed. Both are very much improved. One shows a suggestion of hyperfunction, while the other evidences mild insufficiency.

DISCUSSION

JOHN HUNT SHEPHARD, M. D. (Growers Bank Building, San Jose, California)—Various degrees of round-cell infiltration and fibrosis, as described by the authors, have long been recognized as a part of the pathological picture in certain cases of exophthalmic goiter. Wilson pointed out that by a careful consideration of these factors, together with the degree of desquamation, he was able to judge the relative degree of toxicity, and also tell whether the toxicity was increasing or decreasing.

The frequency of marked round-cell infiltration and fibrosis in any series will depend largely upon the stage of the disease when thyroidectomy is performed. It will be most marked in the specimens removed from patients who have had one or more thyroid crises and who are operated upon when their metabolic rate is approaching or has returned to normal without much decrease in the size of the thyroid gland.

The authors, in this excellent study, have emphasized, though not specifically so stating, the important point that thyroid surgery should be preceded by definite indications, i. e., toxicity, as shown by an increase in the B. M. R.; pressure symptoms; to prevent the future development of hyperthyroidism; acute suppurative conditions; tuberculosis; malignant conditions; and for cosmetic purposes.

WALLACE I. TERRY, M. D. (384 Post Street, San Francisco) — The pathologic picture of true exophthalmic goiter is a hyperplasia with more or less round-celled infiltration. In some cases there is a marked dominance of the round-celled infiltration, and therein we approach thyroiditis. It at first seemed to me that the authors were making subdivisions of a single process, but I am now convinced that they have described in chronic thyroiditis an entity which has heretofore not been clearly recognized. It may well be that some definite organism is responsible for the condition, and it would be well to carry out bacteriologic studies, using relatively large masses of the gland, in accordance with the technic described by Rosenow several years ago.

The final results in these cases are of great importance, particularly as regards hypothyroidism. It will require the study of a considerable number of cases before one can arrive at fair conclusions.

C. L. HOAG, M. D. (177 Post Street, San Francisco)—I think this paper contributes some very important evidence to the theory of infection as a cause of hyperplasia. Round-cell infiltration is very frequently associated with hyperplasia. Doctor Searls has found this condition in about 50 per cent of the material examined at the University of California, but other writers place the percentage much higher.

The findings suggest that if the infection is sufficiently acute an abscess results; if it is less acute there is scar formation and secondary contracture producing the typical ligneous thyroid described. If the process is still less acute there is a combination of hyperplasia and scar tissue, while if chronic we have the usual picture of a true hyperplasia with round-cell infiltration.

Clinically, we are familiar with the beginning of hyperthyroidism or with exacerbations of this disease which have been caused by, or associated with, acute infectious processes.

I believe that the recognition of these various stages of inflammatory reaction in the thyroid may lead to a better understanding of the causes of thyroid hyperplasia.

H. LISSER, M. D. (Fitzhugh Building, San Francisco)—The authors are to be commended for calling our attention to this interesting and confusing disturbance of the thyroid gland. It is to be hoped that their painstaking

analysis of a representative group of patients suffering from chronic thyroiditis with and without hyperplasia will be helpful to many of us who have occasion to study various types of goiter. I am, however, inclined to the belief that a correct diagnosis of chronic thyroiditis will remain exceedingly difficult, even with the suggestive hints that the authors have advanced.

Although I agree that medicinal and x-ray therapy is apt to be futile in this condition, I would urge a conservative surgical attitude as well, except in those cases where signs and symptoms and metabolic rate point to an associated hyperthyroidism. In pure chronic thyroiditis without compensatory hyperplasia, the inflammatory process is apt to be fairly diffuse and involve a considerable portion of the gland. It would seem to me an impossibly delicate procedure to remove just the diseased area and leave sufficient normal thyroid tissue for adequate function. It is true that a consequent post-operative hypothyroidism could be controlled by thyroid extract, but it would seem wiser not to interfere at all unless hyperthyroidism complicate the picture, or local pressure signs and symptoms demand relief.

I am much impressed with the conception that the pathological picture of a chronic thyroiditis, with the addition of hyperplasia, may afford a sound and logical explanation for the not uncommon "mixed" case, where evidence of hyper and hypofunction co-exist in the same individual, a circumstance that has heretofore "mixed" the physician quite as much as the patient, and where a perverted or "dysfunction" has been assumed as the only theoretical "out" from a contradictory situation.

This paper affords a fine example of clinical pathological co-operation.

The present vogue among women to become thin and willowy in order to comply with fashion's dictates has been attended with so many evil results in the way of impaired health that a plea has been made to medical men to discuss the subject from the health standpoint. Accordingly the question of whether women should reduce and how, if they are to retain their health, was debated in New York on February 22 at a gathering of physicians, dietitians, and statisticians at the New York Academy of Medicine, under the direction of the American Medical Association. The meeting really was called at the request of Mrs. William Brown Melloney, editor of the Delineator, who asked medical authorities to provide some age, weight and height tables to guide women in determining at what weight they would be healthiest, and possibly to suggest some means by which the question of how to reduce might be answered. In the discussion that resulted one of the speakers said that he was told by Poiret, the French dressmaker, that American women were almost the only women in the world who wanted to look like barber poles. Other speakers called attention to the evil effects of improper dieting and the use of drugs in an effort to reduce. One of the serious results of reducing is in the production of sterility. Overexercise, rolling machines, starvation diet, going without water, the use of thyroid, iodine, and smoking to excess, all were condemned as injurious. The untutored person frequently eliminates vitamines from his food by doing without cream, butter and other foods, thus bringing about an unbalanced diet that is very harmful and may lead to a pathological condition. The consensus of opinion was that no reducing should be undertaken except under the advice of a competent physician, and that all women need a well-balanced ration, but that there would be less tendency to accumulation of fat if the well-balanced ration is limited in amount and with the requisite amount of sleep, and with temperate habits. The American women were further admonished that it is better to be reasonably fat and healthy than to be thin and sickly.—Journal Indiana Medical Association, March, 1926.

All over the country Charleston marathon contests are being held. Usually four or five of the contestants jig for some thirty hours, and are then carried to the city hospitals in a state of collapse. Silly? Of course. And what an absurdity it is for the cities to allow such contests and then care for the winners at the public's expense. —The Outlook.

SOME SURGICAL ASPECTS OF TUBERCULAR PERITONITIS

By CHARLES D. LOCKWOOD *

Brief report of two cases, with discriminating digest of current practices in diagnosis and treatment.

DISCUSSION *by W. R. P. Clark, San Francisco; E. C. Moore, Los Angeles; C. T. Sturgeon, Los Angeles.*

TUBERCULAR peritonitis is a border-line affection concerning the surgeon and physician, including the tuberculosis specialist. Some recent experiences have impressed me with the fact that it is often overlooked, and that it is not given sufficient weight in the average physical examination. Its relative rarity and the obscurity of its symptoms account for our failures to detect it.

Before the discovery of the tubercle bacillus several forms of chronic peritonitis were recognized and described under different names, chief of these being the so-called chronic idiopathic peritonitis. Most of these cases were, doubtless, of tubercular origin, but there is still a small number of cases in which the specific cause is not clear. Although we now recognize the tubercle bacillus as the specific cause of tubercular peritonitis, there is still much difference of opinion as to the pathologic anatomy of the disease and its mode of invasion. It is impossible to demonstrate the tubercle bacillus in many cases of chronic peritonitis, even when the characteristic lesions, i. e., tubercles, are present.

While there are many interesting factors in the causation of the disease, such as age, heredity and trauma, the greatest interest centers in the mode of infection. Most authorities agree that the peritoneum is rarely the site of the initial lesion. The vast majority are secondary to some other focus, but the avenue by which the infecting organism

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* **Charles D. Lockwood** (295 Markham Place, Pasadena, California). M. D. Northwestern University, 1896; A. B. Northwestern University, 1893. Graduate study: Internship Cook County Hospital, Chicago, 1896-1897; University of Vienna, 1906, 1911. Practice limited to surgery and diagnosis since 1911. Hospital connections: Pasadena Hospital. Previous honors and services: President Western Surgical Association; Professor of Oral Surgery, University of Southern California College of Dentistry; member of staff Los Angeles General Hospital; Major Medical Corps, United States Army; organized Red Cross Ambulance Company No. 1, 1916; C. O. Camp Hospital No. 33, Brest, France, during World War; five months on western front with surgical team. Scientific organizations: Western Surgical, Pacific Coast Surgical, Los Angeles County, Clinical and Pathological, Los Angeles Surgical, American Medical Association, and California Medical Association. Appointments: Commanding Officer Surgical Hospital No. 71, United States Reserve. Publications: "Diagnosis of Surgical Lesions of the Kidney" (Surgery, Gynecology, and Obstetrics); "Bier's Hyperemia, or the Use of the Elastic Bandage in the Treatment of Disease" (Southern California Practitioner, April, 1908; "Surgical Treatment of Trifacial Neuralgia" (California State Journal of Medicine, September, 1909); "Venereal Diseases in Children, Their Causes and Prevention (Bulletin of American Academy of Medicine, October, 1910); "Surgical Treatment of Gastric and Duodenal Ulcers" (Southern California Practitioner, October, 1909); "Present Status on Prostatic Surgery (California State Journal of Medicine, June, 1913); "Ulcer of the Stomach in Children before Puberty (Surgery, Gynecology, and Obstetrics, October, 1914); "Ureteral Fistulae" (The Urologic and Cutaneous Review, November, 1916); "Surgical Treatment of Banti's Disease" (Surgery, Gynecology, and Obstetrics, August, 1917); "Review of Five Hundred Operations for Battle Casualties" (California State Journal of Medicine, June, 1919); "Surgery of the Chest" (California State Journal of Medicine, March, 1921); "Tumors of the Pancreas" (Journal American Medical Association, January, 1922); "Some Newer Aspects of Chest Surgery" (International Clinics, September, 1922); "The Role of the Physician in the Education of the Nurse" (Report of Twenty-fourth Convention of American Nurses' Association); "Four Cases of Chronic Intestinal Obstruction, Due to Inflammatory Adhesions" (International Clinics, Vol. IV, Series 35).